

Claims

- [c1] 1. A method of fabricating a passivation layer, comprising the steps of:
providing a substrate having a plurality of device structures and at least an interconnect thereon;
forming a patterned metallic layer over the interconnect;
performing a plasma-enhanced chemical vapor deposition process to form a first passivation layer over the metallic layer, wherein the plasma-enhanced chemical vapor deposition process is carried out at a processing pressure between about 9 to 25 Torrs; and
forming a moisture impermeable second passivation layer over the first passivation layer.
- [c2] 2. The method of claim 1, wherein the plasma-enhanced chemical vapor deposition process is carried out with a processing power between about 1 to 600 Watts.
- [c3] 3. The method of claim 1, wherein the first passivation layer comprises a silicon oxide layer.
- [c4] 4. The method of claim 1, wherein the second passivation layer comprises a silicon nitride layer.

- [c5] 5. A method of fabricating a passivation layer, comprising the steps of:
providing a substrate having a plurality of device structures and at least an interconnect thereon;
forming a patterned metallic layer over the interconnect;
performing a semi-atmospheric chemical vapor deposition process inside a reaction chamber to form a first passivation layer over the metallic layer; and
forming a moisture impermeable second passivation layer over the first passivation layer.
- [c6] 6. The method of claim 5, wherein the reactive materials used in the semi-atmospheric chemical vapor deposition process comprises liquid tetra-ethyl-ortho-silicate (TEOS) and ozone.
- [c7] 7. The method of claim 6, wherein the liquid tetra-ethyl-ortho-silicate flowing into the reaction chamber has a flow rate between 500 sccm to 3000 sccm and the ozone flowing into the reaction chamber has a flow rate between 5000 sccm to 15000 sccm.
- [c8] 8. The method of claim 5, wherein the pressure inside the reaction chamber during the semi-atmospheric chemical vapor deposition process is between about 20 to 750 Torrs.

- [c9] 9. The method of claim 5, wherein the semi-atmospheric chemical vapor deposition process is carried out at a temperature between about 200°C to 600°C.
- [c10] 10. The method of claim 5, wherein the first passivation layer comprises a silicon oxide layer.
- [c11] 11. The method of claim 5, wherein the second passivation layer comprises a silicon nitride layer.